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Diapycnal Mixing in the Cape Ghir upwelling region

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One oceanographic survey was carried out within a project multidisciplinary (PROMECA) from 18 to 29 October 2010 in the Canary Basin. During three days, Conductivity –Temperature depth (CTD), Expandable Bathythermograph (XBT) and Microstructure turbulence (free fall profilers: turboMAP and Baklán) data were obtained in several stations in the Cape Ghir upwelling region. Also during the cruise, velocity data were measured by a vessel Acoustic Doppler Current Profiler (ADCP) with a vertical bin size of 8 m. The first results show how the vertical distribution of the dissipation rate of turbulent kinetic energy, ε , is modified by the filaments present in the region. These oceanographic structures intensify the vertical shear of the flow and modify the vertical gradients of temperature and salinity, thus influencing in the sources of mixing processes associated (Kelvin-Helmholtz instabilities and double diffusion). The ε values found range between 10^{-7} and 10^{-10} W/kg in the first 500 m of the water column with maximum values near the surface or associated to the filaments.

With the dissipation rates of thermal variance, χ , estimated from microstructure data, we are applying a model based in the dissipation ratio, ratio of the diffusivities for heat and buoyancy, to estimate the net turbulence diffusivities when processes of double diffusion and turbulence induced by vertical shear of the flow are present in the same region.